Datak Premier series Printed Circuit Board User's Instructions.

General.
This series of boards is intended for use with "positive" printed circuit board transparencies or "art". The circuit should be as dark as possible, preferably completely black and opaque, and the "background" should be transparent. Prepare your art either by printing the circuit (either in a copier or laser printer) on clear film or use Datak drafting aids to create the art mechanically.

Exposing.
The board must me *exposed* before developing. Please read through all instructions before beginning the process.

The first step is to place the board in a fixture with the positive on top so that the art will be held firmly against the surface of the board. For a fixture, a Datak exposure frame*,or a heavy piece of glass may be used to hold the positive firmly against the PC board.

(*either stock number ER-10 or ER-56)

The light source must contain some ultraviolet, so not just any light will do the job. You may use:

light source	**exposure time/distance**
BRIGHT SUNLIGHT , CLEAR DAY BETWEEN 11 A.M. & 1 P.M. WINTER OR ABOUT 10:30 A.M. TO 3:30 P.M. DURING SUMMER MONTHS.	EXPOSE FOR TEN MINUTES.
Desk Lamp (or equivalent) with two 15 watt fluorescent bulbs.	at about 1-3/4" distance, expose for 8-10 minutes. For larger boards, increase the distance but if you double the distance, then increase the time to 28 to 30 minutes.
Datak no. ER-39 photoflood bulb. Bulb life is about four hours total usage.	expose ten minutes at a distance of 12" This is a good source for larger boards up to 12" square.
Sunlamp (375 watt for tanning skin) (these bulbs are now hard to find.)	expose eight minutes at a distance of 14"

Note that the board is supplied with a protective film cover to prevent exposure or damage to the coated surface. You may handle the board in normal room lighting for the purpose of measuring and cutting the board (etc.) as long as you leave this film in place. When you are ready to expose the board, remove the protective film and place your art positive on top of the newly exposed surface; clamp it tightly in an exposure frame. We recommend that you use a yellow "bug" light bulb as a safe-light during the process from removal of the protective film all of the way through the etching process.

DEVELOPING:
Mix Datak Developer concentrate (either no. 12-402 or 12-406) ten parts warm tap water to one part concentrate. Place the mixture in a plastic or glass tray and develop. The Image will become visible as development proceeds; continue the process until the "background" (i.e. the area that will later be etched and removed) is bare copper.
tips:

Keep the solution near room temperature (72 degrees F.).
Agitate or rock the tray gently during developing. The process takes a few minutes. The circuit will become visible; stop when all of the background copper is completely bare (shows no sign of resist residue).
Finally, rinse board for one minute in cold tap water which hardens the surface.

Etching:
Inspect the board before etching to see if there are any breaks in the protective resist, which could cause breaks in the circuit. Touch up any bare spots with a Datak etch resist pen to protect the copper during etching.

Always use a plastic or glass container to hold the etchant (etching solution). Datak Ferric Chloride solution is recommended for the best job. Prepare the solution according to the instructions included with the etchant. And NOTE that this process is always best if the etchant is very warm (from 100 to 130 degrees F. suggested). Room temperature etching takes much longer.

Etching requires nearly constant rocking of the tray; **keep the solution in motion most of the time.** And PROTECT YOUR EYES from splashes. Rinse eyes thoroughly with cold water if exposed; then consult a physician. The etchant will stain clothing; wear old cloths or a lab coat.
(For the frequent user, a Datak part number 12-700 power etching tank is ideal. It will etch one or two boards and does not require constant attention on your part.)

REMOVE THE ETCH RESIST. When the etching has completely removed all copper from the "background", you may drill the board and remove the remaining etch resist that is covering the copper circuit. Do not "sand" the resist, this may harm the copper layer. Use a solvent and soft cloth or paper towel. Solvents that work are xylene, toluene, and nail polish remover (non-acetone types suggested). Spot removers such as "Good-Off" contain xylene and many solvent based adhesive thinners will work. The resist may be left in place until just before soldering to protect the copper.

Trouble Shooting: You will not likely have a problem unless you are making a serious mistake of some kind; problems are rare with the process. But here are the most common trouble spots that could occur.

If traces and pads are thin compared to the art work, you are either not clamping the positive art tightly against the board or you may be over exposing. Try using a good exposure frame that will press the positive down tightly (and evenly) and consider reducing the exposure time. Or, increase the distance from the light source.

IF the circuit is "weak" and not holding up in the developer, you may have a "thin" positive. You must try to get the circuit pattern as close to opaque (black) as possible; a light weight, grey, pattern will leak light and ruin the pattern.

Under-exposure (too little time) to the light source will produce either very slow developing or inadequate developing. Use one of the suggested light sources. Some regions of the country occasionally suffer from low "house-current" voltage; typically those at less than 107 volts AC can cause the light source to work poorly.

Thank you for using a Datak product. Your business is appreciated and we hope that you are satisfied with our products.

ADDENDUM

WHEN PRE-CUTTING DATAK PREMIER P.C. BOARDS, YOU MUST FIRST SCORE PROTECTIVE FILM WITH SHARP BLADE.